

Name:

Date:

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**PART A** In the space on the left, write the letter of the term or phrase which **best** completes the statement or answers the question (1 mark each).

- \_\_\_\_ 1. The slope of a velocity-time graph represents ...  
a. Distance  $\div$  time  
b. Displacement  $\div$  time  
c. Change in velocity  $\div$  time  
d. Change in acceleration  $\div$  time
- \_\_\_\_ 2. A horizontal line on a velocity-time graph represents a \_\_\_\_ acceleration.  
a. Positive  
b. Negative  
c. Constant  
d. Zero
- \_\_\_\_ 3. The area under a velocity-time graph represents ...  
a. Acceleration  
b. Displacement  
c. Velocity  
d. Time
- \_\_\_\_ 4. A straight line on a velocity-time graph represents \_\_\_\_ velocity.  
a. Constant  
b. Zero  
c. Negative  
d. Positive
- \_\_\_\_ 5. When plotting a velocity-time graph, which data would you plot on the x-axis?  
a. Distance  
b. Time  
c. Displacement  
d. Velocity
- \_\_\_\_ 6. If an object at rest increases to a velocity of +22 m/s in 4s, the acceleration of the object is ...  
a. 88 m/s  
b. 5.5 m/s  
c. 88 m/s<sup>2</sup>  
d. 5.5 m/s<sup>2</sup>

- \_\_\_ 7. By calculating the slope of the tangent to the line of a velocity-time graph, we get ...  
a. Instantaneous acceleration  
b. Instantaneous velocity  
c. Instantaneous speed  
d. Instantaneous displacement
- \_\_\_ 8. Which of the following is a scalar quantity?  
a. Time  
b. Velocity  
c. Acceleration  
d. Gravity
- \_\_\_ 9. A dropped object hits the ground with a velocity of 28 m/s. How long did it take to fall?  
a. 2.9s  
b. 274s  
c. 28s  
d. 10s
- \_\_\_ 10. You can use a displacement-time graph to produce ...  
a. A velocity-time graph  
b. An acceleration-time graph  
c. Both A & B  
d. None of the above

**PART B** In the space provided mark each of the following as true or false. (1 mark each)

- \_\_\_ 1. Time is a scalar quantity.
- \_\_\_ 2. Terminal velocity occurs when a falling object no longer accelerates.
- \_\_\_ 3. The area under a line on a velocity-time graph represents acceleration.
- \_\_\_ 4. An object with a constant velocity has a positive acceleration.
- \_\_\_ 5. Negative acceleration only occurs on objects with a negative velocity.
- \_\_\_ 6. Acceleration is a scalar quantity.
- \_\_\_ 7. Change in velocity can be calculated by dividing acceleration by change in time.
- \_\_\_ 8. A horizontal line on a velocity-time graph means the object is at rest.
- \_\_\_ 9. Velocity is represented by the slope of a velocity-time graph.
- \_\_\_ 10. A velocity-time graph provides information on velocity, acceleration, and displacement.

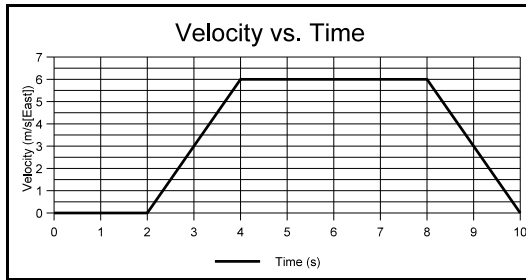
**PART C** In the space provided, match each term or phrase with the best definition. (1 mark each)

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|------------------------------|--|
| ___ 1. Constant acceleration | A. Occurs when a car's velocity decreases over time interval.              |
| ___ 2. Velocity              | B. Occurs when a car's velocity increases over a time interval.            |
| ___ 3. Instantaneous         | C. Displacement over time.   |
| ___ 4. Terminal velocity     | D. When the force upward equals the force downward on a falling object.    |
| ___ 5. Negative acceleration | E. Can be represented by a point on the x-axis of velocity-time graph.     |
| ___ 6. Positive acceleration | F. Represented by a horizontal line on the velocity-time graph.            |
| ___ 7. Zero velocity         | G. Occurs when there is a constant change of velocity over time.           |
| ___ 8. Change in time        | H. Can be calculated by dividing $\Delta$ velocity by acceleration.        |
| ___ 9. Constant velocity     | I. A constant force experienced by all objects on the earth.               |
| ___ 10. Gravity              | J. _____ acceleration is an object's acceleration at a particular instant. |

**PART D** Each of the following questions requires a short or calculated answer.

1. A skydiver jumps out of a plane. How long does it take the skydiver to reach a velocity of 100 m/s? Be sure to show all your calculations for full marks! (2 marks)
2. A boat decelerates at  $-2\text{m/s}^2$  for 8 seconds. Calculate the boat's change in velocity. Show all your calculations for full marks. (2 marks)
3. Describe the velocity of an object with positive velocity that starts accelerating negatively, stops, and keeps accelerating negatively for a long period of time. (2 marks)

Use this velocity-time graph to answer questions 4–11.



For each of the time intervals below, describe the acceleration of the object. (1 mark each)

4. 0s–2s

5. 2s–4s

6. 4s–8s

7. 8s–10s

Calculate the acceleration for each of the following time intervals, being sure to include the direction. Show all your calculations for full marks. (2 marks)

8. 0s–2s

9. 8s–10s

10. A ball is thrown upward with an initial velocity of 20 m/s. What will the ball's velocity be after 4 s? The acceleration of gravity is  $9.8 \text{ m/s}^2$  down. (2 marks)
11. After accelerating at  $5 \text{ m/s}^2$  [E] for 6 s, a truck's velocity is 35 m/s [E]? What was the truck's initial velocity? (2 marks)
12. Using the velocity-time graph, calculate the displacement of the car over the 2 s interval. (2 marks)

